

Case 2996

***Pila* Röding, 1798 and *Pomacea* Perry, 1810 (Mollusca, Gastropoda): proposed placement on the Official List, and AMPULLARIIDAE Gray, 1824: proposed confirmation as the nomenclaturally valid synonym of PILIDAE Preston, 1915**

Robert H. Cowie

Bishop Museum, 1525 Bernice Street, P.O. Box 19000, Honolulu, Hawaii 96817-0916, U.S.A.

Abstract. One purpose of this application is to place the names *Pila* Röding, 1798 and *Pomacea* Perry, 1810 on the Official List. The names refer, respectively, to Old and New World genera of freshwater operculate gastropods, known as apple snails, which are widely distributed over the tropics and subtropics, except the Australian region. The name *Ampullaria* Lamarck, 1799, a junior objective synonym of *Pila*, is sometimes used for both the Old and New World species, while *Ampullarius* de Montfort, 1810 has also been used for New World taxa. A second purpose of this application is to propose that AMPULLARIIDAE Gray, 1824 (type genus *Ampullaria*) be confirmed as the nomenclaturally valid name for the family, which includes ten genera and some 100 species. The objectively synonymous name PILIDAE Preston, 1915 is also in use by some authors. One or more species have recently become agricultural pests in south east Asia and in the Pacific Islands.

Keywords. Nomenclature; taxonomy; Gastropoda; *Pila*; *Pomacea*; *Ampullaria*; *Ampullarius*; AMPULLARIIDAE; PILIDAE; apple snails; agricultural pests.

1. The question of the validity of the generic name *Ampullaria* Lamarck, 1799 was first raised with the Commission in 1930 by H.A. Pilsbry and H.B. Baker. They applied to place 12 mollusk generic names on the Official List, an action which at that time implied conservation. Six of the names were placed on the List in Opinion 119 (January 1931) but the views of the mollusk specialists consulted were divided over the remaining names, including *Ampullaria*, and a decision on these was deferred. The Commission Secretariat has had correspondence on *Ampullaria* during the past 50 years but no further application has been published until now. There were no detailed rules for family-group names until publication of the 1961 edition of the Code.

2. Röding (1798, p. 145) proposed the generic name *Pila* for six species of freshwater snails, including the Asian species *Helix ampullacea* Linnaeus, 1758 (p. 771). The latter is the type species of *Pila* by subsequent designation by Dall (1904, p. 53). The name *Ampullaria* Lamarck, 1799 (p. 76) was introduced for the single species *H. ampullacea*, which is therefore the type of *Ampullaria* by monotypy. Dall's (1904) designation of *H. ampullacea* as the type species of *Pila* rendered *Ampullaria* a junior objective synonym of *Pila* despite his (invalid) designation of the New World *Nerita urceus* Müller, 1774 (p. 174) as the type of *Ampullaria* (see Pain, 1972, p. 455; Berthold, 1991, p. 247). The six taxa originally included in *Pila* by Röding (1798)

were both Old and New World species, although the name as currently used is restricted to Old World taxa. *Pila* and most Old World taxa have a calcareous operculum; in all New World genera the operculum is horny.

3. The *Museum Boltenianum* (1798), in which the name *Pila* first appeared, was a catalogue compiled by J.F. Bolten of his large mollusk collection. It was prepared for publication as a sales catalogue after Bolten's death by P.F. Röding, who added the synonyms used in Gmelin's ([1791]) edition of Linnaeus's *Systema Naturae* and references to published figures. New generic names published in the work were largely ignored in the 19th and first part of the 20th centuries because very few copies of the work were known before the publication of a facsimile edition (of 75 copies) in 1906; the new genera were not described, their identity being determined only by the included nominal species which were themselves recognized only by bibliographic references to published figures: many authors considered that new names published in sale catalogues were not available; and adoption of the new names would have cast into synonymy many of the familiar names introduced by Lamarck the following year. Dall (1904) was the first author to adopt names published in the *Museum Boltenianum* but it was not until 1926 (Opinion 96) that the work was accepted by the Commission as being available. It was placed on the Official List in 1956 (Direction 48) with authorship attributed to P.F. Röding. No diagnosis was given for *Pila* but the included species were accompanied by references to the names, publications and illustrations of previous authors. *Pila* Röding, 1798 is therefore available under Articles 12b(5) and 12b(7) of the Code.

4. Authors in the 19th and first part of the 20th centuries (see, for example, Philippi, 1851; Reeve, 1856; Martens, 1873; Sowerby, 1909; Kobelt, 1911–1915; and Alderson, 1925) used the name *Ampullaria* Lamarck for species from both the Old and New Worlds. Considerable confusion has persisted since the publication of Opinion 96 because some authors have continued to overlook or disregard priority by using *Ampullaria* rather than *Pila* for the Old World species and, following Dall's (1904) invalid type designation, especially for New World species generally now placed in the genus *Pomacea* (para. 5 below) (see, for example, the recent publications of Martin, 1986; Lanzer & Schafer, 1987; Pointier, Théron & Imbert-Establet, 1988; Vaught, 1989; and Anderson, 1993).

5. In 1801 Lamarck (p. 93) published on *Ampullaria* again and included the New World nominal species *A. rugosa* Lamarck, 1801 (a junior synonym of *Nerita urceus* Müller, 1774; see de Montfort, 1810; Reeve, 1856; and Martens, 1873). Lamarck added to his (1799) diagnosis 'muni d'un opercule corné' (with a horny operculum). Dall (1904) designated (invalidly, see para. 2 above) *N. urceus* as the type of the genus. In 1810 de Montfort (pp. 242 (fig.) and 243 (text)) applied the name *Ampullarius* to *N. urceus* Müller, 1774 (= *A. rugosa* Lamarck); de Montfort cited Lamarck and emended the latter's name *Ampullaria* to *Ampullarius* ('Ampullaire: en latin, *Ampullarius*'). The name *Ampullarius* de Montfort, 1810 was adopted as valid by many authors for New World species (see Pain, 1956, p. 79; de Oliveira, Rezende & de Castro, 1981, pp. 76–78). Perry (1810, pl. 11 and text, signature G5) introduced the name *Pomacea* for his single new species, *Pomacea maculata*, which was considered by Berthold (1991, p. 248) as a possible junior synonym of *N. urceus* Müller, 1774, although Pilsbry (1927, p. 63) and Pain (1956, p. 79; 1960, pp. 421, 423, 426) had previously retained *urceus* as distinct and synonymised *P. maculata* Perry,

1810 with *Ampullaria gigas* Spix, 1827. However, all three of these nominal species are South American and currently placed in *Pomacea*. The name *Pomacea* was attributed for many years to Perry (1811, text and pl. 3, fig. 3) and cited as a junior synonym of *Ampullarius*. The availability of *Pomacea* from 1810 was overlooked until Mathews & Iredale (1912) published a paper on Perry's little-known work *Arcana*, which was issued in monthly parts (pls. [1–48] in 1810 and pls. [49–84] in 1811). Subsequently the validity of *Pomacea* Perry, 1810 (March) over *Ampullarius* de Montfort, 1810 (after March) was recognized (see Pain, 1956, p. 79; 1960, p. 421; Berthold, 1991, p. 248). The name *Pomacea* refers to New World taxa, some of which have lately been introduced into Asia.

6. I propose that the names *Pila* Röding, 1798 and *Pomacea* Perry, 1810 be placed on the Official List in accord with priority and majority usage as the names for, respectively, the Old and New World groups of species, and that *Ampullaria* Lamarck, 1799 and *Ampullarius* de Montfort, 1810 (an unjustified emendation of *Ampullaria*) be placed on the Official Index as junior objective synonyms of *Pila*.

7. Gray (1824, p. 276) introduced the family name AMPULLARIIDAE (as 'AMPULLARIADAE'), based on *Ampullaria* Lamarck and including both Old and New World taxa. Preston (1915a, p. 96), acknowledging the synonymy of *Pila* Röding, 1798 and *Ampullaria* Lamarck, 1799 and the priority of the former, introduced the name PILIDAE as a new name for AMPULLARIIDAE, perhaps, although not explicitly, considering AMPULLARIIDAE invalid because the generic name on which it was based was a junior synonym. Since the names of their type genera are objectively synonymous the same is true of the family names.

8. Article 40b of the Code states that, if a family-group name (in this case AMPULLARIIDAE) had been replaced before 1961 because the generic name on which it was based is recognized as a junior synonym, then the replacement name (in this case PILIDAE) is to be maintained providing that it has 'won general acceptance'. AMPULLARIIDAE is the earlier name; PILIDAE has been widely used and remains in use by some authors (see, for example, Keawjam, 1986, 1990; Mochida, 1991; Neck & Schultz, 1992; Halwart, 1994), possibly in the mistaken belief that usage of a family-group name is dependent on its name-bearing genus being currently used as a valid name. Arguably, however, the name PILIDAE, although widely used, has not won 'general acceptance'. AMPULLARIIDAE also continues to be used (see, for example, Ponder & Warén, 1988; Cazzaniga, 1990; Berthold, 1991; Smith, 1992; Donnay & Beissinger, 1993; Eldredge, 1994; Cowie, 1995). Berthold (1991, p. 245) provided representative lists of publications using AMPULLARIIDAE and those using PILIDAE but considered that few people preferred PILIDAE. Even Preston himself (the author of PILIDAE) continued to use AMPULLARIIDAE in compiling the Mollusca section of *Zoological Record* from 1915 to 1919 (for publications from 1913 to 1916, see Preston, 1915b, 1916, 1917 and 1919), and even though he included his own publication with the introduction of the name PILIDAE. Conolly (1919, p. 37), following Preston as the compiler of the Mollusca section of *Zoological Record*, continued to use AMPULLARIIDAE. There is a huge literature dealing with the family. Lists of 48 representative publications using AMPULLARIIDAE and 21 publications using PILIDAE are held by the Commission Secretariat; a single additional publication gave both names as equally valid. The name AMPULLARIIDAE currently appears to be the more widely used.

9. PILIDAE Preston, 1915 has thus not won general acceptance and therefore it does not fulfil the requirements of Article 40b which would maintain it as the valid name. AMPULLARIIDAE Gray, 1824 should therefore be retained as the valid name. Members of the family are commonly known as apple snails and are frequently used as domestic aquarium snails. Some species have recently become extremely serious pests of rice and other crops in south-east Asia and of taro in Pacific Islands (Acosta & Pullin, 1991; Mochida, 1991; Smith, 1992; Anderson, 1993; Eldredge, 1994; Cowie, 1995). In retaining the earlier name AMPULLARIIDAE the interests of stability would be served in a group that is likely to attract increasing attention. However, since both PILIDAE and AMPULLARIIDAE remain in current use and 'general acceptance' is open to interpretation, the case is referred to the Commission for a ruling.

10. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to confirm that the family-group name AMPULLARIIDAE Gray, 1824 is the nomenclaturally valid synonym of PILIDAE Preston, 1915;
- (2) to place on the Official List of Generic Names in Zoology the following names:
 - (a) *Pila* Röding, 1798 (gender: feminine) (senior objective synonym of *Ampullaria* Lamarck, 1799), type species by subsequent designation by Dall (1904) *Helix ampullacea* Linnaeus, 1758;
 - (b) *Pomacea* Perry, 1810 (gender: feminine), type species by monotypy *Pomacea maculata* Perry, 1810;
- (3) to place on the Official List of Specific Names in Zoology the following names:
 - (a) *ampullacea* Linnaeus, 1758, as published in the binomen *Helix ampullacea* (specific name of the type species of *Pila* Röding, 1798);
 - (b) *maculata* Perry, 1810, as published in the binomen *Pomacea maculata* (specific name of the type species of *Pomacea* Perry, 1810);
- (4) to place on the Official List of Family-Group Names in Zoology the name AMPULLARIIDAE Gray, 1824, type genus *Ampullaria* Lamarck, 1799 (a junior objective synonym of *Pila* Röding, 1798);
- (5) to place on the Official Index of Rejected and Invalid Generic Names in Zoology the following names:
 - (a) *Ampullaria* Lamarck, 1799 (a junior objective synonym of *Pila* Röding, 1798);
 - (b) *Ampullarius* de Montfort, 1810 (an unjustified emendation of *Ampullaria* Lamarck, 1799 and a junior objective synonym of *Pila* Röding, 1798);
- (6) to place on the Official Index of Rejected and Invalid Family-Group Names in Zoology the name PILIDAE Preston, 1915 (a junior objective synonym of AMPULLARIIDAE Gray, 1824 and invalid by the ruling given in (1) above).

References

- Acosta, B.O. & Pullin, R.S.V. (Eds.) 1991. *Environmental impact of the golden snail (Pomacea sp.) on rice farming systems in the Philippines*. vi, 34 pp. Freshwater Aquaculture Center, Central Luzon State University, Muñoz, Nueva Ecija, and International Center for Living Aquatic Resources Management, Manila.
- Alderson, E.G. 1925. *Studies in Ampullaria*. xx, 102 pp., 19 pls. Heffer, Cambridge.
- Anderson, B. 1993. The Philippine snail disaster. *The Ecologist*, 23(2): 70-72.

- Berthold, T. 1991. Vergleichende Anatomie, Phylogenie und historische Biogeographie der Ampullariidae (Mollusca, Gastropoda). *Abhandlungen des Naturwissenschaftlichen Vereins in Hamburg*, (NF)29: 1–256.
- Cazzaniga, N.J. 1990. Predation of *Pomacea canaliculata* (Ampullariidae) on adult *Biomphalaria peregina* (Planorbidae). *Annals of Tropical Medicine and Parasitology*, 84(1): 97–100.
- Conolly, M. 1919. *Zoological Record*. Mollusca (For 1917). 59 pp. London.
- Cowie, R.H. 1995. Identity, distribution and impacts of introduced Ampullariidae and Viviparidae in the Hawaiian Islands. *Journal of Medical and Applied Malacology*, 5 (1993): 61–67.
- Dall, W.H. 1904. Notes on the genus *Ampullaria*. *Journal of Conchology*, 11(2): 50–55.
- Donnay, T.J. & Beissinger, S.R. 1993. Apple snail (*Pomacea dohioides*) and freshwater crab (*Dilocarcinus dentatus*) population fluctuations in the Llanos of Venezuela. *Biotropica*, 25(2): 206–214.
- Eldredge, L.G. 1994. *Perspectives in aquatic exotic species management in the Pacific islands*, vol. 1 (Introductions of commercially significant aquatic organisms to the Pacific islands). v. 127 pp. South Pacific Commission, Noumea.
- Gray, J.E. 1824. Zoological notices. On some new species of Ampullariidae. *Philosophical Magazine and Journal*, 63(312): 276–277.
- Halwart, M. 1994. The golden apple snail *Pomacea canaliculata* in Asian rice farming systems: present impact and future threat. *International Journal of Pest Management*, 40(2): 199–206.
- Keawjan, R.S. 1986. The apple snails of Thailand: distribution, habitats and shell morphology. *Malacological Review*, 19(1–2): 61–81.
- Keawjan, R.S. 1990. The apple snails of Thailand: molecular genetics. *Journal of Medical and Applied Malacology*, 2: 1–48.
- Kobelt, W. 1911–1915. Die Gattung *Ampullaria*. *Systematischen Conchylien-Cabinet von Martini und Chemnitz*. Bauer & Raspe, Nürnberg.
- Lamarck, J.B.P.A. de M. de. 1799. Prodrome d'une nouvelle classification des coquilles, comprenant une rédaction appropriée des caractères génériques, et l'établissement d'un grand nombre de genres nouveaux. *Mémoires de la Société d'Histoire Naturelle de Paris*, 1: 63–91.
- Lamarck, J.B.P.A. de M. de. 1801. *Système des animaux sans vertèbres*. viii, 432 pp. Déterville, Paris.
- Lanzer, R.M. & Schafer, A.E. 1987. Moluscos dulceaquícolas como indicadores de condições tróficas em lagoas costeiras do sul do Brasil. *Revista Brasileira de Biologia*, 47(1–2): 47–56.
- Linnaeus, C. 1758. *Systema Naturae*, Ed. 10, vol. 1. 824 pp. Salvii, Holmiae.
- Martens, E. von. 1873. Die Binnenmollusken Venezuela's. Pp. 157–225 in: *Festschrift der Gesellschaft Naturforschender Freunde zu Berlin*.
- Martin, S.M. 1986. Ciclo reproductivo de *Ampullaria canaliculata* (Gastropoda: Ampullariidae) en el area rioplatense. *Neotropica*, 32(88): 171–181.
- Mathews, G.M. & Iredale, T. 1912. 'Perry's Arcana' — an overlooked work. *Victorian Naturalist*, 29(1): 7–16.
- Mochida, O. 1991. Spread of freshwater *Pomacea* snails (Pilidae, Mollusca) from Argentina to Asia. *Micronesica, Supplement*, 3: 51–62.
- Montfort, D. de. 1810. *Conchyliologie systématique, et classification méthodique des coquilles*, vol. 2. 676 pp. Schoell, Paris.
- Müller, O.F. 1774. *Vermium terrestrium et fluviatilium*, vol. 2. xxxv, 214 pp. Havniae & Lipsiae.
- Neck, R.W. & Schultz, J.G. 1992. First record of a living channelled apple snail, *Pomacea canaliculata* (Pilidae), from Texas. *Texas Journal of Science*, 44: 115–116.
- Oliveira, M.P. de, Rezende, G. de Jesus R. & Castro, G.A. de. 1981. *Catálogo dos moluscos da Universidade Federal de Juiz de Fora. Sinonímia de família, gênero e espécie*. 520 pp. Ministério da Educação e Cultura, Brazil.
- Pain, T. 1956. Notes on the generic names *Pomacea* and *Ampullarius*. *Journal of Conchology*, 24(3): 79.

- Pain, T. 1960. *Pomacea* (Ampullariidae) of the Amazon River system. *Journal of Conchology*, 24(12): 421-432.
- Pain, T. 1972. The Ampullariidae, an historical survey. *Journal of Conchology*, 27(7): 453-462.
- Perry, G. 1810-1811. *Arcana; or the Museum of Natural History*. 84 pls., unnumbered, with associated text. Issued in monthly parts, pls. [1-48] in 1810, [49-84] in 1811. Stratford, London.
- Perry, G. 1811. *Conchology, or the natural history of shells*. 4 pp., 61 pls. and plate explanations. Miller, London.
- Philippi, R.A. 1851. Die Gattung *Ampullaria*. *Systematischen Conchylien-Cabinet von Martini und Chemnitz*. Bauer & Raspe, Nürnberg.
- Pilsbry, H.A. 1927. On *Pomacea* Perry (Ampullariidae). *The Nautilus*, 41(2): 63-64.
- Pointier, J.P., Théron, A. & Imbert-Establet, D. 1988. Decline of a sylvatic focus of *Schistosoma mansoni* in Guadeloupe (French West Indies) following the competitive displacement of the snail host *Biomphalaria glabrata* by *Ampullaria glauca*. *Oecologia* (Berlin), 75(1): 38-43.
- Ponder, W.F. & Warén, A. 1988. Classification of the Caenogastropoda and Heterostropha — a list of the family-group names and higher taxa. *Malacological Review*, Supplement, 4: 288-326.
- Preston, H.B. 1915a. *The fauna of British India, including Ceylon and Burma*. Mollusca, vol. 4 (Freshwater Gastropoda & Pelecypoda). xiv, 244 pp. Taylor & Francis, London.
- Preston, H.B. 1915b, 1916, 1917, 1919. *Zoological Record*. Mollusca. 95 pp. (1915b, for 1913); 75 pp. (1916, for 1914); 55 pp. (1917, for 1915); 57 pp. (1919, for 1916). London.
- Reeve, L.A. 1856. *Conchologica Iconica*, vol. 10 (*Ampullaria*). 28 pls. with text. Author, London.
- Röding, P.F. 1798. *Museum Boltenianum*, part 2. viii, 199 pp. Trapp, Hamburg.
- Smith, B.D. 1992. Introduction and dispersal of apple snails (Ampullariidae) on Guam. *Pacific Science Association Information Bulletin*, 44(1-2): 12-14.
- Sowerby, G.B. 1909. Notes on the family Ampullariidae. with list of species, varieties, and synonyms, also descriptions of four new species. *Proceedings of the Malacological Society of London*, 8: 345-364.
- Vaught, K.C. 1989. *A classification of the living Mollusca*. xii, 195 pp. American Malacologists, Melbourne, Florida.